WHAT IS CLAIMED IS:

1. An optical bio-disc, comprising:

a cap portion having inlet and vent ports formed therein;

a first channel layer having cut-out portions;

a second channel layer having cut-out portions;

a third channel layer having cut-out portions;

a fourth channel layer having cut-out portions; and

a substantially circular substrate having a center and an outer edge, wherein the substrate is configured to support the cap portion, the first channel layer, the second channel layer, the third channel layer, and the fourth channel layer.

2. The optical bio-disc according to claim 1 wherein said cut-out portions in said first channel layer include at least one of an extended arcuate cut-out, short arcuate cut-outs, an inlet channel cut-out, a radially directed cut-out, and a circumferential cut-out.

3. The optical bio-disc according to claim 1 wherein said cut-out portions in said second channel layer include at least one of an extended arcuate cut-out, dumbell shaped cut-outs, an inlet channel cut-out, a radially directed cut-out with a circular cut-out, and a circumferential cut-out.

4. The optical bio-disc according to claim 1 wherein said cut-out portions in said third channel layer include at least one of an extended arcuate cut-out, dumbell shaped cut-outs, a radially directed cut-out with a circular cut-out, and a circumferential cut-out.

5. The optical bio-disc according to claim 1 wherein said cut-out portions in said fourth channel layer include at least one of an extended arcuate cut-out, short arcuate cut-outs, an inlet channel cut-out, and a circumferential cut-out.

6. The optical bio-disc according to any of claims 1, wherein said cut-out portions are in register with each other such that when the bio-disc is assembled a spiral fluidic circuit is formed having an inlet port, a mixing chamber, upper flow chambers, lower pass through chambers, inlet passages, outlet passages, a circumferential analysis chamber, and vent ports in fluid communication.

7. The optical bio-disc according to claim 1 further comprising a chemically modified membrane placed in one or more of the inlet and outlet passages.

8. The optical bio-disc according to claim 1 further comprising biological matrix placed in one or more of the inlet and outlet passages.

9. A method of making a chromatographic optical bio-disc, said method comprising the steps of:

providing a substrate having a center and an outer edge;

providing a cap portion having an inlet port and a vent port formed therein;

providing a first channel layer having cut-out portions;

providing a second channel layer having cut-out portions;

providing a third channel layer having cut-out portions;

providing a fourth channel layer having cut-out portions; and

assembling the optical bio-disc such that said cap portion and said channel layers are supported by the substrate and said cut-out portions form a spiral fluidic circuit.

10. The method according to claim 9 wherein said cut-out portions in said first channel layer include at least one of an extended arcuate cut-out, short arcuate cut-outs, an inlet channel cut-out, a radially directed cut-out, and a circumferential cut-out.

11. The method according to claim 9 wherein said cut-out portions in said second channel layer include at least one of an extended arcuate cut-out, dumbell shaped cut-outs, an inlet channel cut-out, a radially directed cut-out with a circular cut-out, and a circumferential cut-out.

12. The method according to claim 9 wherein said cut-out portions in said third channel layer include at least one of an extended arcuate cut-out, dumbell shaped cut-outs, a radially directed cut-out with a circular cut-out, and a circumferential cut-out.

13. The method according to claim 9 wherein said cut-out portions in said fourth channel layer include at least one of an extended arcuate cut-out, short arcuate cut-outs, an inlet channel cut-out, and a circumferential cut-out.

14. The method according to any of claims 9, wherein said cut-out portions are in register with each other such that when the bio-disc is assembled a spiral fluidic circuit is formed having an inlet port, a mixing chamber, upper flow chambers, lower pass through

chambers, inlet passages, outlet passages, a circumferential analysis chamber, and vent ports in fluid communication.

15. The method according to claim 14 further comprising the step of placing a bio-matrix pad over said lower pass through chambers.

16. The method according to claim 14 further comprising the step of placing a chemically modified membrane over said lower pass through chambers.

17. The method according to claim 9 further comprising the step of encoding information on an information layer associated with the substrate, the encoded information being readable by a disc drive assembly to control rotation of the disc.

18. The method according to claim 9 further comprising the step of attaching one or more capture agents onto the optical bio-disc.

19. The method of claim 18 wherein said one or more capture agents is selected from the group comprising antigen, antibody, ligand, receptor, binding agents, DNA, RNA, any molecule that can bind to the target or analyte, and any molecule in which the analyte specifically binds to.

20. A method of using an optical bio-disc, the method comprising:

depositing a test sample into the bio-disc through an inlet port;

rotating said bio-disc at a predetermined speed and for a predetermined period of time to allow said test sample to move through a bio-matrix pad so that analytes present in the sample bind to capture agents in the bio-matrix pad;

continuing said rotating step to thereby move said test sample through a spiral fluidic circuit of the optical bio-disc and into an analysis chamber;

depositing signal agents having one or more reporters attached thereto into the bio-disc through said inlet port;

rotating said disc to cause said signal agents to move through said bio-matrix pad so that said signal agents bind to any analyte that is bound to the capture agents in the bio-matrix pad; and

scanning the bio-matrix pads located in the inlet and outlet passages with a beam of electromagnetic radiation to determine the presence and amount of signal agents bound to the analytes within the bio-matrix pads.

21. The method according to claim 20 further comprising the step of calculating the amount of analyte present in the sample based on the amount of bound signal agents.

22. The method of claim 20 wherein said signal agents are selected from the group comprising antigens, antibodies, ligands, receptors, binding agents, DNA, RNA, any molecule that can bind to the target or analyte, and any molecule in which the analyte specifically binds to.

23. The method of claim 20 wherein said one or more reporters is selected from the group comprising any molecule or material detectable by an optical disc drive, and any molecule that produces a detectable signal in the presence of the analyte or a substrate.

24. The method of claim 20 wherein said one or more reporters is selected from the group comprising nanopheres, microspheres, fluorescent particles, chemiluminscent particles, phosphorescent particles, enzymes, and enzyme substrates.